

Government Led Educational Financing as the Real Driver of Women's Workforce Empowerment Beyond Artificial Intelligence

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Abstract

This study focuses on assessing the effectiveness of government-led educational financing in empowering women, using evidence from one-sample t-test analysis of the Pudhumai Penn Scheme in Tamil Nadu. The research adopts a descriptive research design and is based on primary data collected from 194 girl students enrolled in higher education. One-sample t-tests were applied to compare the mean scores of awareness, educational impact, and social empowerment against the neutral benchmark value. The results indicate that all three dimensions—awareness (Mean = 4.57), educational impact (Mean = 4.44), and social empowerment (Mean = 4.36)—are significantly higher than the test value, with $p < 0.001$ in all cases. These findings confirm that government educational financing plays a statistically significant role in reducing financial barriers, supporting educational continuity, and strengthening confidence and decision-making abilities among women students. The study implies that sustained public investment in education is a crucial driver of women's workforce empowerment beyond technology-centric approaches such as Artificial Intelligence.

Keywords: Educational Financing, Women Empowerment, Pudhumai Penn Scheme, Workforce Preparedness, Human Capital Development, Workforce Empowerment.

1. INTRODUCTION:

Education plays a vital role in empowering women and preparing them for meaningful participation in the workforce. However, many women in India still face financial and social barriers that prevent them from continuing their education. Government-led educational financing helps address these challenges by reducing economic pressure and supporting girls in completing higher education.

While recent discussions often highlight Artificial Intelligence as a key driver of workforce readiness, its benefits can only be realized when women have a strong educational foundation. In this context, public investment in education remains more inclusive and impactful. The Pudhumai Penn Scheme of Tamil Nadu is one such initiative that provides financial assistance to girl students to encourage educational continuity. This study focuses on assessing how such government-led financing contributes to women's workforce empowerment beyond technology-driven approaches.

2. OBJECTIVES OF THE STUDY:

1. To study the demographic profile of girl students benefiting from the Pudhumai Penn Scheme in Tamil Nadu.
2. To assess the level of awareness among girl students regarding the Pudhumai Penn Scheme.
3. To examine the educational impact of government-led educational financing on higher education continuity among women students.
4. To test whether the mean awareness score of beneficiaries significantly differs from the neutral benchmark value using a one-sample t-test.

3. STATEMENT OF THE PROBLEM

Despite increasing focus on Artificial Intelligence and advanced technologies as key drivers of workforce empowerment, many women—especially those from economically disadvantaged backgrounds—continue to face significant barriers in accessing education and employment opportunities. Technology alone cannot ensure workforce readiness unless it is supported by a strong educational foundation and inclusive public policies. In this context, government-led educational financing schemes play a vital role in reducing financial constraints, preventing dropouts, and promoting continuity in higher education among women.

The Pudhumai Penn Scheme in Tamil Nadu is a targeted initiative that provides direct financial assistance to girl students with the aim of empowering them through education. However, limited empirical evidence exists to assess the extent to which such educational financing improves awareness, educational outcomes, and social empowerment, thereby contributing to women's workforce preparedness. Moreover, differences in awareness and educational impact across demographic factors such as type of institution, income level, and level of study call for a systematic analysis. Therefore, this study seeks to examine whether government-led educational financing offers a more inclusive and sustainable pathway to women's workforce empowerment beyond technology-centric approaches like Artificial Intelligence.

4. REVIEW OF LITERATURE:

1. **Chowdaiah and Mathew (2024)** reviewed the status of women's participation in emerging technology domains such as Artificial Intelligence, big data, and cloud infrastructures within a technology-driven economy. Using a qualitative review of secondary literature, the study identifies persistent gender disparities caused by limited access to education, workplace discrimination, and weak professional networks, particularly in developing countries. While increased female participation in AI-driven sectors offers economic and innovation benefits, the authors argue that technology alone cannot bridge gender gaps. The study emphasizes the need for strong policy interventions and educational financing to build an inclusive digital workforce ecosystem.
2. **George (2024)** analyzed the persistent gender gap in STEM fields and its implications for technological innovation and economic growth in the era of the Fourth Industrial Revolution. The study highlights severe underrepresentation of women, especially women of color, in STEM employment and leadership roles, leading to inequality in pay, innovation, and decision-making. Drawing on global evidence, the author emphasizes that without strong policy support, funding incentives, and educational interventions, women will remain excluded from future technologies. The study reinforces the need for sustained public investment in education and skill development to ensure inclusive workforce empowerment.

3. **Alateeg and Al-Ayed (2024)** examined the influence of Artificial Intelligence on women-led startups in Saudi Arabia using a qualitative approach based on in-depth interviews with women entrepreneurs. The study identifies cultural norms, societal expectations, limited awareness, and financial constraints as key barriers to women's participation in AI-driven ventures. The findings emphasize that educational initiatives, mentorship programs, and academia–industry collaboration are essential to equip women with AI-related skills. The authors argue that financial inclusion and supportive ecosystems, beyond technology alone, are critical for empowering women entrepreneurs in emerging AI landscapes.
4. **Ramchandani (2024)** examined the influence of Artificial Intelligence on women's empowerment in the Indian context, focusing on education, healthcare access, economic participation, and gender equality. Through an analysis of initiatives and case studies, the study highlights AI's potential to reduce gender gaps and enhance women's socio-economic status. However, it also cautions that technological advancement alone is insufficient, as embedded biases and exclusionary practices may limit impact. The author emphasizes the need for inclusive frameworks, ethical AI deployment, and supportive educational policies to ensure that AI contributes meaningfully to women's empowerment.
5. **Ojo and Ndzendze (2024)** examined women's participation in the Fourth Industrial Revolution (4IR) across Africa, focusing on policy frameworks, digitalization, and the role of artificial intelligence. Using case studies from Egypt, Kenya, and Cameroon, the study highlights persistent gender disparities in STEM education, tech entrepreneurship, and leadership, driven by limited access to funding, mentorship, and networks. While challenges remain, initiatives such as Womena and She Codes, along with African Union–led policies, demonstrate growing commitment to empowering women. The authors emphasize that inclusive educational and policy support is essential for sustainable women's empowerment in the 4IR era.

5. RESEARCH METHODOLOGY:

The study uses a descriptive research design to assess the effectiveness of government-led educational financing in empowering women for workforce participation, with a focus on the Pudhumai Penn Scheme in Tamil Nadu. Primary data were collected from 194 girl students enrolled in government and government-aided institutions through a structured questionnaire using a five-point Likert scale to measure awareness, educational impact, and social empowerment. Secondary data from journals, policy documents, and reports were also used to support the analysis.

Statistical tools such as percentage analysis, one-sample *t*-test, and Chi-square test were employed to examine mean differences and the relationship between demographic factors and the scheme's outcomes. The study was conducted during the 2024–2025 academic year. Limitations include the restricted geographic scope and the use of convenience sampling, which may affect the generalizability of the findings.

6. DATA ANALYSIS AND INTERPRETATION:

The study collected primary data from 194 girl students enrolled in higher education institutions under the Pudhumai Penn Scheme in Tamil Nadu. Demographic analysis showed that the beneficiaries came from both government and government-aided colleges, with varied family income levels and academic programs. Most respondents demonstrated high awareness of the scheme, reflecting effective communication of government initiatives.

The one-sample *t*-test revealed that mean scores for awareness (4.57), educational impact (4.44), and social empowerment (4.36) were significantly above the neutral benchmark ($p < 0.001$). This indicates that government-led educational financing positively affects educational continuity and boosts confidence and decision-making among students. Chi-square tests further showed significant relationships between demographic factors—such as type of institution, family income, and level of study—and both awareness and perceived educational impact.

Overall, the findings confirm that financial support through government schemes improves educational outcomes, reduces dropout risks, and enhances women's readiness for the workforce. This supports the view that educational financing serves as a foundational driver of empowerment, complementing rather than being replaced by technology-focused approaches like Artificial Intelligence.

7. FINDINGS AND SUGGESSTIONS:

The study reveals that the Pudhumai Penn Scheme effectively reaches its target group, with the majority of beneficiaries being undergraduate girls aged 17–20 from government and government-aided colleges, spanning diverse academic streams and predominantly from low- and middle-income families. Awareness of the scheme is significantly high, particularly among undergraduates and private college students, and is equitably distributed across income levels. Educational impact is substantial, improving continuity in higher education, academic focus, attendance, and motivation for further studies, with low- and middle-income students perceiving greater benefits. The scheme also strengthens confidence, decision-making, and workforce preparedness, demonstrating that government-led educational financing supports women's empowerment beyond technology-centric approaches such as Artificial Intelligence. Based on these findings, it is suggested to expand awareness campaigns in government-aided institutions, enhance financial support for middle-income students, introduce mentorship and skill-building programs, establish continuous monitoring mechanisms, and integrate educational financing with broader women empowerment initiatives to ensure comprehensive social and professional development.

8. CONCLUSION:

The study concludes that government-led educational financing, exemplified by the Pudhumai Penn Scheme, plays a significant role in empowering women and preparing them for workforce participation. The analysis demonstrates that the scheme effectively enhances awareness, supports continuity in higher education, improves academic performance, and strengthens social empowerment among beneficiaries. While technological solutions such as Artificial Intelligence offer potential for workforce readiness, this research highlights that educational financing provides a more foundational and inclusive driver of empowerment. By reducing financial barriers and promoting confidence, decision-making, and long-term human capital development, sustained government investment in education emerges as a critical strategy for ensuring equitable and meaningful participation of women in the workforce.

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